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The Templeton Crocker Expedition. III. Brachygnathous Crabs
from the Gulf of California and the West Coast
of Lower California.¹

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(Plates I-VIII).

[Note: This is the third of a series of papers dealing with the specimens collected on the Twenty-fourth or Templeton Crocker Expedition of the Department of Tropical Research of the New York Zoological Society; William Beebe, Director. For data on dredges, localities, dates, etc., concerning the capture of specimens treated in this paper, refer to the present volume of *Zoologica*, No. 2, pp. 33 to 46.]

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SUMMARY OF IMPORTANT POINTS.

The most interesting features of the present collection and report may be summarized as follows:

1. The following paper records all of the brachygnathous crabs taken by the Templeton Crocker Expedition with the exception of the specimens taken at Clarion Island.

2. The total of 73 species is more than one-third of all of the brachygnathous crabs previously recorded from the Gulf of California and the west coast of Lower California.

3. The collection contains the following 7 new species: *Mithrax mexicanus* Glassell, *Stenocionops beebei* Glassell, *Actaea crockeri* Glassell, *Pilumnus pelagius* Glassell, *Chasmocarcinus ferrugineus* Glassell, *Cymopolia zacae* Glassell and *Cymopolia cortezi*, sp. nov. The last species is described in the present paper; the others, described by Mr. Steve A. Glassell, will be found in *Zoologica*, Vol. XXI, No. 17, pp. 213-218.

4. The 4 following species have not been reported previously from the Gulf of California-Lower California area: *Rochinia vesicularis* (previously known only from the Galápagos), *Parthenope* (*Pseudolambrus*) *excavata* (previously known only from Panama and Manzanillo), *Ovalipes punctatus* (a cosmopolitan species not recorded before in the eastern Pacific north of Peru), and *Trapezia cymodoce ferruginea* (a cosmopolitan species not previously recorded in the eastern Pacific north of the Revilla Gigedo Islands).

5. The 12 following species, while they have been known from the western coast of Lower California or from Cape San Lucas or both, have not been reported previously from the Gulf of California: *Podochela barbarensis*, *Inachoides laevis*, *Erileptus spinosus*, *Lissa aurivilliusi*, *Pitho sexdentata*, *Mithrax* (*Mithrax*) *tuberculatus*, *Macrocoeloma villosum*, *Medaeus lobipes*, *Micropanope polita*, *Trapezia digitalis*, *Chasmocarcinus latipes* and *Cymopolia lucasii*.

6. The vertical ranges of the 20 following species have been extended in either or both directions by more than 5 fathoms: *Stenorhynchus debilis*, *Podochela barbarensis*, *Podochela latimanus*, *Inachoides laevis*, *Euprognatha bifida*, *Collodes tumidus*, *Dasygygius depressus*, *Rochinia vesicularis*, *Mithrax* (*Mithrax*) *sinensis*, *Mithrax* (*Mithrax*) *spinipes*, *Stenocionops contigua*, *Tyche lamellifrons*, *Parthenope* (*Platylambrus*) *exilipes*, *Portunus minimus*, *Portunus pichilinqueni*, *Micropanope nitida*, *Quadrella nitida*, *Chasmocarcinus latipes*, *Cymopolia lucasii*, and *Cymopolia zonata*.

7. Color notes and sketches were secured in the field from many living specimens. The "Color in Alcohol" notes were all made within 4 months of the capture of the crabs.

8. Food analyses and egg counts have been made in numerous instances, studies which have not been undertaken before on crabs from this area. It is planned to correlate and tabulate these results (which in the present paper appear under the names of the various species) in ecological papers which are now in course of preparation. It should be stated here that in every case the number of eggs carried by specimens of the same species varied directly with the size of the female.

INTRODUCTION.

Relatively little taxonomic discussion has been found necessary in the study of the present collection, thanks to Mary J. Rathbun's splendid monographs² on the crabs of America. Since her nomenclature and synonymy are followed throughout, references are omitted except to the few species which have been described since the publication of the monographs.

Length and breadth measurements were made as follows: Length, from the most anterior tip of the rostrum to the middle of the posterior edge of the carapace, unless otherwise stated. Breadth, the maximum width of the carapace, unless otherwise stated.

The catalogue numbers given all refer to specimens in the collections of the Department of Tropical Research of the New York Zoological Society.

The photographs are the painstaking work of Mrs. Ruth Needham Nauss.

²M. J. Rathbun: 1918. The Grapsoid Crabs of America. *Bull.* 97, *U. S. Nat. Mus.*; 1925, The Spider Crabs of America, *Bull.* 129, *U. S. Nat. Mus.*; 1930, The Cancroid Crabs of America of the Families Eurydalidae, Portunidae, Atelecyclidae, Cancridae and Xanthidae, *Bull.* 152, *U. S. Nat. Mus.*

My sincere thanks are due to Mr. Steve A. Glassell of the San Diego Society of Natural History for his descriptions of the 6 new species mentioned above, and for the identification of several puzzling series of specimens; to Mr. Templeton Crocker for giving me the opportunity of studying these interesting crustaceans in the field, and to Dr. William Beebe for entrusting the collection to me and for supervising the entire study.

Superfamily Oxyrhyncha.

Family Majidae.

Subfamily Inachinae.

Stenorhynchus debilis (Smith), 1871.

General Range: From Magdalena Bay, Lower California, and the Gulf of California to Chile and the Galápagos Islands. From low water mark to 50 fathoms.

Local Distribution: A total of 54 specimens was taken from San Lucas Bay (Station 135), Gorda Banks (Station 150), Arena Bank (Station 136) and the Inez area (Stations 141 and 142, and the shore of Santa Inez Point) between low water mark and 50 fathoms, on bottoms ranging from muddy or shelly to sandy or rocky with weed.

Sex and Size: Males, which measured 9 to 27 mm. in length of carapace, were almost half again as numerous as the females, which measured from 12 to 28 mm. Ovigerous females ranged from 17 to 24.5 mm. Detailed measurements of the two largest specimens in the collection are as follows: Ovigerous female, length of carapace 24.5, breadth of carapace 11, length of rostrum 11.5, length of cheliped 31 mm. Male, length of carapace 27, breadth of carapace 10, length of rostrum 15, length of cheliped about 48 mm.

Color in Life: Carapace always marked with narrow vertical and oblique, alternate stripes of dark brown, white and buff. The specimens taken on weedy bottoms, however, had a greenish cast which was wholly lacking in the crabs living in other areas. Rostrum and all legs except chelipeds reddish-brown or dull lavender mottled or barred with buff. Merus of chelipeds of adult male pale buff, the palm and fingers olive; merus of chelipeds of female and young like other legs, the palm and fingers bright orange. Carapace coloration of young like that of adult, except that the body stripes were much paler, the dark brown of grown specimens being faint tan. Eggs deep cream.

Food: An examination of fifteen stomachs of specimens from different stations showed these crabs to be omnivorous; the majority had fed either on algae or minute crustaceans (probably amphipods), but a single minute anemone was the sole content of one stomach, and a sea urchin of another.

Breeding: Ovigerous specimens numbered two-thirds of all the females, and were taken in every area in which the species was captured with the exception of San Lucas Bay.

The eggs measured .38 to .4 mm. in diameter. Four counts gave totals ranging from 215 (on a female measuring 17 mm. in length) to 975 (on a 23 mm. specimen).

Remarks: The present series extends the vertical range from 31 to 50 fathoms.

Material: Station 135: D-20 (1 ♂). Station 136: D-1 (2 ♀, 5 ♂), D-5 (1 ♀, 3 ♂), D-11 (2 ♂), D-12 (1 ♀), D-13 (1 ♀), D-14 (2 ♀, 3 ♂), D-15 (1 ♀), D-23 (1 ♂), D-24 (4 ♀, 10 ♂), D-26 (1 ♂), D-28 (1 ♀), D-30 (1 ♀, 2 ♂). Station 141: D-1 (1 ♀), D-4 (1 ♀). Station 142: D-1 (1 ♂). Shore of Santa Inez Point: (1 ♂). Station 150: D-7 (1 ♀, 2 ♂), D-8 (1 ♀), D-10 (4 ♀).

Of these 54 specimens, 29 are preserved (Cat. Nos. 36,694, 36,695, 36,696, 36,834, 36,835, 36,836).

Podochela barbarensis Rathbun, 1924.

General Range: From the Santa Barbara Islands, California, to the Gulf of California. From 1 to 60 fathoms.

Local Distribution: A total of 7 specimens was taken from the Cedros Island region (Station 126), Arena Bank (Station 136) and the Inez Area (Station 144) between 1 and 60 fathoms, on bottoms composed of sand and rocks with weed.

Sex and Size: The 4 females measured from 9.4 to 16 mm., the 3 males from 7.4 to about 20 mm. (tip of rostrum broken).

Color in Alcohol: Pale ochre, the chelipeds conspicuously banded with reddish in both sexes.

Food: Three stomachs contained large quantities of pulverized algae mixed with sand; a fourth held short lengths of algal stems.

Breeding: Two of the females (1 from the Cedros Island region and 1 from Arena Bank) were ovigerous. The former, measuring 12.3 mm. in length, carried 98 eggs .65 mm. in diameter; the latter, measuring 13.5 mm., carried 177 eggs .7 mm. in diameter.

Habits: All of the specimens carried a few pieces of weed, especially on the ambulatories. The female from Station 136 D-27 had bits of sponge attached both to her carapace and legs.

Remarks: The present collection extends the range of this species both horizontally and vertically: hitherto it was known only from the Santa Barbara Islands off California and from a series taken by the *Albatross* near Los Coronados Islands off the northern part of Lower California; these previously known specimens were taken between 38 and 50 fathoms.

Material: Station 126: D-10 (2 ♀, 1 ♂). Station 136: D-27 (1 ♀), D-31 (1 ♂). Station 144: D-1 (1 ♀, 1 ♂). Cat. Nos. 36,700, 36,874, 36,875.

Podochela hemphillii (Lockington), 1877.

General Range: From San Luis Obispo, California, to the Gulf of California. From 3 feet to 50 fathoms.

Local Distribution: A total of 14 specimens was taken from the shore of Magdalena Bay and from Arena Bank (Station 136) between 3 feet and 50 fathoms on various types of bottom ranging from sandy and rocky to muddy; algae usually present.

Sex and Size: The series consists of 3 ovigerous females ranging from 9.3 to 11.5 mm. in length, 3 non-ovigerous females from 7.6 to 12.4 mm., and 8 males from 7 to 16 mm.

Color in Life: Pale buff to light brown.

Food: The stomachs of specimens from Magdalena Bay contained amphipods, those from Arena Bank (about a half dozen examined) all contained algae mixed with sand.

Breeding: The 3 ovigerous females carried from 58 to 95 eggs, each measuring .59 mm. in diameter.

Habits: All 4 specimens taken from Magdalena Bay entirely lacked decoration; while those from Arena Bank all carried bits of weed, sponge and hydroids, though not nearly enough to conceal the crab.

Remarks: The 4 Magdalena males are typical *P. hemphillii* in every way. The deep-water specimens from Arena Bank differ in the following particulars: The cardiac and gastric prominences are more conspicuously elevated, even in young specimens, and the movable segments of the antennae are slightly thicker.

Material: *Shore of Magdalena Bay*: (4 ♂). Station 136: D-1 (2 ♀), D-11 (1 ♂), D-14 (1 ♂), D-23 (2 ♀), D-24 (2 ♀), D-30 (2 ♂). Cat. Nos. 36,699, 36,873.

Podochela latimanus (Rathbun), 1893.

General Range: Gulf of California. From 1 to 35 fathoms.

Local Distribution: A total of 9 specimens was taken from the Inez area (Stations 141, 142 and 144) between 1 and 35 fathoms, on muddy or shelly sand with weed.

Sex and Size: The 4 females, all ovigerous, ranged from 15 to about 17 mm. (rostrum broken) in length of carapace, while the 5 males were from 8.9 to about 28 mm. long. Detailed measurements of the two largest specimens were as follows: Female, length of carapace behind anterior margin of orbit 11, breadth 11, cheliped 14 mm. Male, length of carapace behind anterior margin of orbit 18, breadth 17, cheliped 28 mm. (shell soft).

Color in Alcohol: Uniformly yellow buff, more or less speckled with black in the sulci between regions and on the ventral surface. Close to the margin of the last abdominal segment in each female were two pairs of conspicuous dark circles, the two in the middle being the larger. Fingers of chelipeds with scarlet bar at or near tip in both sexes.

Food: The stomachs of 5 specimens, representing 3 dredges and both sexes, were all crammed with amphipods.

Breeding: The 4 females carried between 400 and 800 eggs ranging from .59 to .75 mm. in diameter.

Habits: Only one specimen had the least trace of weed attached to it. In contrast to other species of this genus, *P. latimanus* is characteristically smooth.

Remarks: This species has been previously recorded to a depth of only 11 fathoms.

The tip of the rostrum was broken in every specimen of the present series.

Material: Station 141: D-1 (1 ♂). Station 142: D-2 (1 ♀, 1 ♂). Station 144: D-1 (3 ♀, 2 ♂), D-2 (1 ♂). Cat. Nos. 36,868, 36,870, 36,871.

Podochela vestita (Stimpson), 1871.

(Plate I).

General Range: Cape San Lucas and Gulf of California. From 11 to 35 fathoms.

Local Distribution: A total of 3 specimens was taken from Arena Bank (Station 136) and the Inez area (Station 143) between 29 and 35 fathoms on sandy bottoms with weed.

Sex and Size: The series consists of an adult male and ovigerous female which were taken in the same net, and a young male. Measurements gave the following results: Ovigerous female: Length 20, breadth 15, cheliped 21, ambulatories ca. 40.5, 30, 25 and ? mm. Adult male: Length 21.5, breadth 18, cheliped ca. 24, ambulatories ca. 47, 40, 32, and 29 mm. Young male: Length 12.6, breadth 9.7, cheliped ca. 16, ambulatories ca. 34, 25, 21, 19 mm.

Color in Life: Adults, reddish-brown, the chelae speckled with scarlet. Young male, pale buffy-yellow; chelae speckled with scarlet; bases of ambulatories tinged with pink.

Food: The stomachs of both the female and the young male contained bits of algae.

Breeding: The eggs carried by the female had already hatched, and many zoeas, each measuring about 2.3 mm. in length, were clustered around the anterior margin of the sternum.

Habits: All 3 specimens carried a few bits of algae held by the curved hairs, especially on the ambulatories.

Remarks: This species has been known previously from only 2 specimens, both young: namely, Stimpson's type of *Podonema vestita* (Ann. Lyc.

Nat. Hist. New York, vol. 10, 1871, p. 97) from Cape San Lucas, a female which measured 13.2 mm. in length and which is not extant; and Rathbun's type of *Podochela* (*Coryrhynchus*) *mexicana* (*Proc. U. S. Nat. Mus.*, vol. 16, 1893, p. 225), a male 10 mm. in length from the Gulf of California. The species were synonymized by Rathbun in 1925 (*Bull.* 129, *U. S. Nat. Mus.*, p. 42); to the rostrum the adjectives "short, rounded, . . . arcuate, thin" were applied, while the sternum and basal segments of the legs were described as "vermiculated. Sternal segments in the form of raised plates with sharp edges and separated by deep depressions."

The present specimens disagree with the description of these important characters in the following particulars: the rostrum, instead of being rounded, is bilobed in all the specimens, the lobes being conspicuous and unequal in the large male and female, and barely indicated by a slight, median emargination in the 12.6 mm. male; along the margins of the rostrum is a row of spinules which are clearly distinguishable even in the young specimen. The sternum is exactly as described except that the vermiculations are spinulous, especially in the large specimens.

In all other particulars given in the published descriptions, however, the young male, at least, of the present series agrees perfectly, and where the characteristics of the 2 adults differ from those of the young, the differences are merely intensifications of these characters obviously due to age or sex: The cardiac protuberances of the adults are higher and more compressed and scarcely continued forward (in the 12.6 mm. male the forward projection is evident, but not as pronounced as in Rathbun's 10 mm. specimen); the hepatic and pterygostomial lobes are relatively more developed; the outer margin of the basal antennal article is more conspicuously bi-lobed; and, finally the manus of the adult male is considerably, instead of slightly, swollen, the fingers gaping instead of meeting at the base. In view of these rather extensive, but obviously developmental, differences, it seems reasonable to attribute also to age the differences in the shape of the rostrum and the spinulation of both rostrum and sternum described in the preceding paragraph.

Details of the structure of the chelipeds in the adult male are as follows: Merus with a few small spinules on both outer and inner lower margins. Carpus with 7 or 8 small tubercles, the most anterior much the largest, scattered on the upper-outer surface. Manus considerably swollen, the outer surface covered with a dense, short pubescence and with some long, straight hairs (longest on the margins) and a few short, curved hairs, some of which form a longitudinal row; upper and lower margins each armed with an irregular row of very small spinules; 5 or 6 minute tubercles in a crooked line and several even smaller spinules on the nearly bare, inner surface of palm. Fingers slender, slightly gaping at base. Chelipeds of female slender, tubercles on inner surface of palm lacking.

Material: Station 136: D-30 (1 ♂). Station 143: D-1 (1 ♀, 1 ♂). Cat. Nos. 36,697, 36,869.

Inachoides laevis Stimpson, 1860.

General Range: Atlantic: from the west coast of Florida to Desteno, Brazil. Pacific: from Santa Inez Bay, Gulf of California, and Magdalena Bay, Lower California, to Panama. From 3 fathoms or less to 29 fathoms.

Local Distribution, Sex and Size: Two specimens, an ovigerous female and a male measuring 9.6 and 9.4 mm. in length respectively, were taken in the Inez area (Station 143) at a depth of 29 fathoms, the bottom being composed of crushed shell mud with a little weed.

Food: Traces of crustaceans, probably amphipods, were found in both stomachs.

Breeding: The female carried 362 eggs measuring .59 mm. in diameter.

Habits: Neither of the specimens was decorated.

Remarks: This variable species has not been recorded previously from the Gulf of California, and apparently has not been taken as deep as 29 fathoms. The present specimens have the sharp supraorbital tubercle described by Rathbun (1925 p. 61) as present on the Magdalena specimen, but the antennal ridges are coarsely denticulate in the male, and almost smooth in the female. There are about 15 good-sized tubercles on the inner surface of the manus of the cheliped in the male, and 3 or 4 large, along with a number of small ones on the outer surface. The manus of the female is almost smooth.

Material: Station 143: D-1 (1 ♀, 1 ♂). Cat. No. 36,876.

Erileptus spinosus Rathbun, 1893.

General Range: From Santa Rosa, California, to Abreojos Point, Lower California; Gulf of California. From 21 to 60 fathoms.

Local Distribution: A total of 14 specimens was taken from the Inez area (Station 147) in a single net at a depth of 60 fathoms, the bottom being composed of mud and crushed shell.

Size and Sex: The 10 females of the collection measured between 3.5 and 6.4 mm. in length, 9 of them being ovigerous. The single non-ovigerous female was immature and measured 4.6 mm. The 4 males were from 6 to 10 mm. long.

Food: Six stomachs all contained indeterminate animal remains and a few grains of sand.

Breeding: The 3.5 mm. female carried 21 eggs, a middle-sized specimen 46 and the largest 76. The diameters ranged from .43 to .48 mm.

Remarks: This species has not been reported before from the Gulf of California.

Material: Station 147: D-2 (10 ♀, 4 ♂). Cat. No. 36,837.

Eucinetops lucasii Stimpson, 1860.

(Plate II, Figures 5, 6).

General Range: Gulf of California and Cape San Lucas, Lower California. Shallow water.

Local Distribution, Sex and Size: Two males, each measuring 6.9 mm. in length, were taken in the Inez area (Station 144) at a depth of 1 fathom on a sandy bottom with weed.

Color in Alcohol: The chelipeds, and, to a lesser extent, the ambulatories were conspicuously banded and marbled.

Habits: The specimens were fairly well covered with algae.

Remarks: This is the third time this species has been taken, neither of the other specimens being extant. Our two males agree well with the descriptions (accepting Rathbun's synonymy given in 1925, p. 85) except for the following details: the rostral horns of the more developed specimen are distinctly but abruptly pointed or spined, similar to those of *E. panamensis*, while the rostrum itself and the horns are longer; the younger male on the other hand has one horn blunt, possibly broken, and the other pointed, although not so sharply as in the older specimen. The eye-stalks, however, agree well with Lockington's description of his 8-mm. specimen, each stalk being about as long as the distance between the bases of the eyes; when in a natural position, pointing obliquely outward, each extends almost twice the length of the postocular spine beyond its tip, measuring the length of the spine along its anterior margin. This character alone separates the species from *E. panamensis*.

In addition to the 3 tubercles in a transverse line on the gastric region mentioned in Stimpson's description of the female, the carapaces of the present specimens are ornamented with 4 spines and tubercles and a number of small lumps on each branchial region, arranged as follows: a distinct spine, directed upward, slightly above the postero-lateral curve of the carapace, a smaller spine or tubercle in front of this, and 2 tubercles in a transverse line between it and the cardiac region; finally, there is a prominent oblong swelling on the summit of the branchial region and a few scattered, minute tubercles.

In both specimens the merus of the chelipeds is nearly smooth, slightly lumpy at most, not tuberculate as in Lockington's older specimen, while the tooth on the inner side of the movable finger near its base is also lacking. Both of these are doubtless age characters. It is of interest that the cheliped of one of the present specimens is considerably longer and thicker than that of the other crab of the same length.

Due to the small size of these specimens, a neotype is not proposed.

Material: Station 144: D-1 (2 ♂). Cat. No. 36,838.

Euprognatha bifida Rathbun, 1893.

General Range: Both coasts of Lower California. From 3 feet to 45 fathoms.

Local Distribution: A total of 59 specimens was taken from Magdalena Bay, San Lucas Bay (Station 135), Gorda Banks (Station 150), Arena Bank (Station 136) and the Inez area (Station 142) between 3 feet and 45 fathoms, usually on sandy bottoms, or on bottoms of sand and crushed shell.

Sex and Size: Males, which measured 5 to 10 mm. in length, were almost 3 times as numerous as the females, which measured from 5.1 to 7.9 mm. Ovigerous females ranged from 5.1 to 7.4 mm.

Color in Life: Pale gray.

Food: The specimen from Magdalena Bay contained an amphipod; all the other stomachs examined, numbering a dozen from various dredges, contained grains of sand mingled with finely digested algae.

Breeding: Of the 16 females taken, 14 were ovigerous. The eggs, measuring .43 mm. in diameter, were difficult to count accurately since they dissolved at a touch; the usual number, however (based on 6 counts) was about 70.

Habits: In 2 widely separated localities, namely Arena Bank and the Inez area, these little gray crabs were found clinging tightly to worm tubes which they exactly matched in color.

Remarks: This species has not been taken previously in water less than 18 fathoms or more than 40 fathoms in depth. In the specimens from the San Lucas region, the tubercles of both sexes are blunter and less conspicuous than in those from the other regions.

Material: *Shore of Magdalena Bay:* (1 ♀). Station 135: D-9 to D-26 incl. (7 ♀, 13 ♂). Station 136: D-1 (1 ♀), D-5 (1 ♂), D-6 (1 ♂), D-13 (1 ♂), D-26 (1 ♀, 1 ♂), D-30 (1 ♀, 1 ♂). Station 142: D-1 (2 ♂), D-2 (4 ♀, 22 ♂). Station 150: D-8 (1 ♀, 1 ♂). Cat. Nos. 36,701, 36,702, 36,839, 36,840, 36,877.

Collodes tenuirostris Rathbun, 1893.

General Range: Western coast of Lower California; Gulf of California. From 33 to 145 fathoms.

Local Distribution: 3 females, from 14 to 19 mm. in length, were taken from the Inez area (Stations 142 and 146) between 33 and 35 fathoms on bottoms composed of mud and crushed shell.

Food: The stomachs of 2 specimens contained algae.

Breeding: A single specimen was ovigerous. It measured 15.5 mm. in length by 13 in breadth and carried 246 eggs, .51 mm. in diameter.

Material: Station 142: D-2 (2 ♀). Station 146: D-1 (1 ♀). Cat. Nos. 36,841, 36,842.

Collodes tumidus Rathbun, 1898.

General Range: Western coast of Lower California; southern part of Gulf of California. From 10 to 35 fathoms.

Local Distribution: A single young male, measuring 6.6 mm. in length, was taken on Arena Bank (Station 136 D-30; Cat. No. 36,703) at a depth of 35 fathoms on coarse sand with weed.

Remarks: This specimen is the fourth ever recorded, and increases the recorded depth from 12 to 35 fathoms. The chelipeds are not yet inflated.

Pyromaia tuberculata (Lockington), 1877.

General Range: From Monterey Bay, California, to the Bay of Panama. From 3½ to 66 fathoms.

Local Distribution: 4 specimens were taken from the Inez area (Station 143) between 25 and 35 fathoms on bottoms ranging from soft mud with shell to firm sand, with or without weed.

Sex and Size: The single female, ovigerous, measured 14 mm. in length and 11 in breadth; the 3 males were from 9.9 mm. long by 7.2 mm. wide to 12.7 mm. long and 9.4 mm. wide.

Food: The 2 stomachs examined contained bottom detritus including Foraminifera.

Breeding: The female carried 387 eggs measuring .35 mm. in diameter.

Remarks: All of the specimens were typical representatives of the "variety A" designated by Rathbun (1925, p. 136), which includes specimens from the Lower California region and is characterized by the presence of 2 well developed gastric tubercles.

In both the smallest and largest male the manus of the cheliped was considerably swollen, while in the middle-sized crab it was scarcely inflated at all.

Material: Station 143: D-1 (1 ♂), D-2 (1 ♀), D-3 (1 ♂), D-4 (1 ♂). Cat. No. 36,843.

Dasygygius depressus (Bell), 1835.

General Range: Gulf of California; Galápagos Islands. From 6 to 60 fathoms.

Local Distribution: A total of 363 specimens was taken from Gorda Banks (Station 150), Arena Bank (Station 136) and the Inez area (Stations 142, 143, 146 and 147) between 29 and 60 fathoms, usually on mud bottoms; in 4 out of the 19 dredges in which the species occurred, however, the bottom was sandy or rocky.

Sex and Size: Females, which measured 10.2 to 19 mm. in length, were almost twice as numerous as the males, which measured from 8.4 to 27.5 mm. Ovigerous females ranged from 17.5 to 19 mm. The chelipeds of the males were fully developed in specimens 22 mm. in length and over. Detailed measurements of the 2 largest specimens in the collection were as follows: Ovigerous female, length of carapace 19, breadth of carapace 21, length of cheliped 18.5 mm. Male, length of carapace 24.5, breadth of carapace 27.5, length of cheliped 32 mm.

Color in Life: Entire crab pinkish with olive-gray pubescence, except for manus and dactyls of cheliped, which were pure white. Eggs coral-red.

Food: An examination of 17 stomachs gave the following results: 11 held sand, usually almost filling stomach; 2 (a male and female from Station 142 D-3) contained remains of the oxystomatous crab, *Randallia americana*; 1 held unidentifiable crustacean remains; 3 were entirely empty.

Breeding: Over four-fifths of all females were ovigerous. The eggs measured from .43 to .48 mm. in diameter. Counts on six specimens gave totals ranging from 205 to 230.

Habits: The viability of these crabs seems very low: all of the numerous specimens taken were either dead when the net came up or nearly so, dying soon after. The movements of even those in the best condition were invariably sluggish.

Remarks: This species has not hitherto been reported below 26.5 fathoms.

Material: Station 136: D-1 (1 ♂), D-4 (26 ♀ and ♂), D-5 (1 ♂), D-7 (3 ♀, 3 ♂), D-10 (3 ♂), D-13 (1 ♂), D-14 (32 ♀, 4 ♂), D-15 (42 ♀, 11 ♂), D-16 (10 ♀, 15 ♂), D-17 (5 ♀, 6 ♂), D-18 (1 ♀), D-23 (1 ♂). Station 142: D-2 (1 ♂), D-3 (3 ♀, 2 ♂). Station 143: D-1 (43 ♀ and ♂), D-2 (79 ♀ and ♂), D-3 (33 ♀ and ♂), D-4 (20 ♀ and ♂), D-5 (13 ♀ and ♂). Station 146: D-1 (2 ♂). Station 147: D-2 (1 ♂). Station 150: D-8 (1 ♀).

Of these 363 specimens, 35 are preserved (Cat. Nos. 36,704, 36,844, 36,845, 36,846, 36,878).

Subfamily Acanthonychinae.

Epialtus minimus Lockington, 1877.

(Plate II, Figure 7).

General Range: Gulf of California. From low tide to 2½ fathoms.

Local Distribution: A total of 15 specimens was taken from the San Lucas area (Station 144) between the low-tide mark and 2½ fathoms on sandy bottom with weed and stones.

Sex and Size: The 9 females ranged in length from 8.2 to 14.5 mm.; the 7 males from 6 to 18 mm. Ovigerous females measured from 9.4 to 14.5 mm.

Color in Life: Creamy to ochraceous yellow, the chelipeds and ventral surface sometimes spotted or blotched with brown.

Food: All stomachs examined were crammed with algae.

Breeding: Of the 9 females, 7 were ovigerous. The eggs measured .48 mm. in diameter. Four counts gave totals ranging from 145 to 680, the number depending, as usual, directly on the size of the crab.

Habits: Bryozoans were attached to one crab and bits of sponge to another; the remainder were not decorated.

Remarks: The following sexual differences are apparent in the present series: In the females the pre-hepatic length is much shorter than in the males, being contained up to more than 3 times in the post-hepatic length, instead of almost, or more than equalling it. (In the present series, however, all of the males have the pre-hepatic length slightly shorter than the post-hepatic, whereas in some of Rathbun's specimens it was equal. See Rathbun, 1925, p. 155). Also, the females have the anterior margin of the hepatic lobe irregularly scalloped, instead of with a single low tooth, and the supra-orbital tooth is better developed than in the male. It will be seen from the photograph that, even in addition to sexual differences, the species is very variable.

Material: Station 144: D-1 (4 ♀, 3 ♂), D-2 (2 ♀, 1 ♂), D-3 (1 ♀, 2 ♂).

Shore of Santa Inez Bay: (1 ♀, 1 ♂). Cat. Nos. 36,847, 36,848.

Sphenocarcinus agassizi Rathbun, 1893.

General Range: From the Gulf of California to Panama. From 14 to 71 fathoms.

Local Distribution: A total of 24 specimens was taken from Gorda Banks (Station 150) and Arena Bank (Station 136) between 40 and 70 fathoms, almost always on muddy bottoms. In 2 of the 11 dredges in which it was taken, however, the bottom was sandy.

Sex and Size: The 21 females measured from 13.5 to 44 mm. in length, the 3 males from 14.5 to 58 mm. The smallest ovigerous female measured 29.5 mm. Detailed measurements of the two largest specimens in the collection were as follows: Ovigerous female, length 44, breadth 30, length of cheliped 32 mm. Male, length 58, breadth 36, length of cheliped 75 mm.

Color in Life: General color olive brown, usually darkest posteriorly. In the adult males the entire cheliped, with the exception of the dorso-exterior surface of the merus, was bright rose red, sometimes speckled with black, while the projecting parts of the ventral surface were similarly colored. Large females occasionally also had a tinge of pink ventrally. Eggs bright scarlet or grenadine orange to mulberry red, ova of the latter shade being almost ready to hatch.

Food: 7 stomachs contained only slight traces of mud; while 1 held the body and operculum of a small snail.

Breeding: Ovigerous specimens numbered two-thirds of all the females. The eggs measured .54 mm. in diameter. A specimen 29.5 mm. long carried 315 eggs, one of 33.5 mm. 850 eggs, and one of 44 mm. 1,650 eggs.

Habits: These crabs had very little vitality. The majority were dead when the dredge reached the surface, while those that were still alive died almost immediately, even when placed at once in aquariums.

Material: Station 136: D-2 (3 ♀), D-8 (3 ♀, 1 ♂), D-9 (1 ♀), D-16 (1 ♂), D-18 (2 ♀), D-20 (2 ♀), D-22 (6 ♀), D-23 (1 ♀), D-24 (1 ♀), D-26 (1 ♀). Station 150: D-4 (1 ♀, 1 ♂). Cat. Nos. 36,705, 36,706.

Subfamily Pisinae.

Rochinia vesicularis (Rathbun), 1907.

(Plate III, Figures 8, 9).

General Range: Off Galápagos Islands; southern part of Gulf of California. From 40 to 300 fathoms.

Local Distribution: 3 specimens were taken from Gorda Banks (Station 150) in a single net between 40 and 100 fathoms on a rocky bottom.

Sex and Size: The young female measured more than 13 mm. in length by 9 in breadth; the 2 males each over 11.5 by 8 and over 19.5 by 15 mm., respectively. The tips of the rostrum were broken off in every specimen.

Remarks: This species has been known previously only from 3 specimens, including the male holotype 20.7 mm. long, all taken off the Galápagos Islands at a depth of 300 fathoms. The present trio of specimens differs from the published description and figures in the relatively greater breadth of the carapace and in the shorter legs. The number and arrangement of all the spines, however—including the 2 very characteristic spines on the basal antennal article and the spine on the lower margin of the orbit outside the antennal article—as well as the presence of spherical vesicles on the carapace, indicate that the differences in proportions are due only to the youth of the present specimens. As has already been stated, the tips of the rostral horns are broken in all 3 specimens.

Material: Station 150: D-5 (1 ♀, 2 ♂). Cat. No. 36,707.

?Herbstia tumida (Stimpson), 1871.

General Range: Gulf of California and Manzanillo, Mexico.

Local Distribution: 3 juvenile specimens (Cat. No. 36,757) each measuring about 5.5 mm. in length, were taken off Arena Bank (Station 136 D-33) in coral (*Pocillopora ligulata*) at a depth of $2\frac{1}{2}$ fathoms.

Remarks: This species has been known previously from only 2 specimens, Stimpson's non-extant type from Manzanillo, and a specimen in the American Museum of Natural History from the Gulf of California, 13.5 mm. in length. Allowing for the difference in age, the present series of young specimens agrees well with the descriptions, except for the relative flatness of the carapace and the absence of a small tooth at the insertion of the first movable article of the antenna. Additional material is needed for an adequate knowledge of the characters of this and closely related species.

Lissa aurivilliusi Rathbun, 1898.

General Range: West coast of Lower California; southern part of Gulf of California; Galápagos Islands. To a depth of 35 fathoms.

Local Distribution: A single male (Cat. No. 36,708), 11 mm. in length, was taken from Arena Bank (Station 136 D-30) at a depth of 35 fathoms on a sandy bottom with weed.

Habits: The carapace was decorated with bits of sea urchin test and fragments of sponge.

Remarks: This is the first time this species has been taken within the Gulf.

Lissa tuberosa Rathbun, 1898.

General Range: Southern part of Gulf of California. From 7 to 30 fathoms.

Local Distribution: A single non-ovigerous female (Cat. No. 36,709), 12 mm. in length, was taken from Gorda Banks (Station 150 D-7) at a depth of 20 to 30 fathoms on a sandy bottom.

Remarks: The teeth at the anterior angles of the front are slightly more, not less, advanced than the submedian lobes. In all other respects, however, the specimen agrees perfectly with the description.

This species has not been previously reported below 10 fathoms.

Subfamily Majinae.

Thoe sulcata Stimpson, 1860.

General Range: West coast of Mexico from Tepoca Bay in the Gulf of California to the State of Oaxaca. From low tide to at least $2\frac{1}{2}$ fathoms.

Local Distribution: A single male (Cat. No. 36,758), 7.3 mm. in length, was taken from a piece of coral (*Pocillopora ligulata*) brought up close to Arena Bank (Station 136) from a depth of $2\frac{1}{2}$ fathoms.

Pitho picteti (Saussure), 1853.

General Range: West coast of Mexico including the Gulf of California; Central America. From 3 feet to 45 fathoms.

Local Distribution: A single male (Cat. No. 36,849), 15.5 mm. in length, was taken under a stone in 3 feet of water on the shore of Magdalena Bay.

Habits: The crab was well decorated with large grains of sand and bits of shell and weed.

Pitho sexdentata Bell, 1836.

General Range: Gulf of California; Cape San Lucas; Galápagos Islands. Shallow water.

Local Distribution: A single male (Cat. No. 36,867), 10 mm. in length, was taken off Santa Inez Point on some floating weed.

Habits: The crab was decorated with large grains of sand and bits of weed.

Remarks: This species has not been recorded previously from north of Cape San Lucas.

Mithrax (Mithrax) mexicanus Glassell, 1936.

(Plate III, Figures 10, 11).

General Range: Gulf of California. At 50 fathoms.

Local Distribution: A single specimen, the male holotype (Cat. No. 36,712), was taken on Arena Bank (Station 136 D-27) at a depth of 50 fathoms on a bottom composed of sand and rock.

Remarks: For a description of this species, see *Zoologica*, XXI, No. 17, p. 213. The holotype is deposited in the collections of the Department of Tropical Research of the New York Zoological Society.

Mithrax (Mithrax) sinensis Rathbun, 1892.

General Range: Gulf of California. From 7 to 30 fathoms.

Local Distribution: A single young female (Cat. No. 36,710), 7 mm. long, was taken on Gorda Banks (Station 150 D-7) between 20 and 30 fathoms on a sandy bottom.

Remarks: This species has not been recorded previously below 17 fathoms.

Mithrax (Mithrax) spinipes (Bell), 1836.

General Range: From the Gulf of California to Ecuador and the Galápagos Islands. From 2½ to 45 fathoms.

Local Distribution: 2 specimens were taken from Arena Bank (Station 136) in 2½ and 45 fathoms of water, respectively. The shallow water specimen was found in a piece of coral (*Pocillopora ligulata*), while the deep water crab was from a muddy bottom.

Sex and Size: The specimens were male and young female, measuring 10.1 and 17.5 mm. respectively, the larger specimen having been taken in deep water.

Color in Life: Carapace and chelipeds violet pink; ambulatories faintly pink above; ventral surface grayish-white. (Described from the female specimen).

Remarks: The female from deep water differs from typical members of the species in having a single good-sized tubercle instead of two small ones on the anterior mesogastric region, in which respect it resembles *M. acuticornis*. Mr. Steve A. Glassell, who has kindly examined our specimen, says he finds the species to be variable in this character.

This species has been recorded previously only between 6 and 33 fathoms.

Material: Station 136: D-1 (1 ♀), D-33 (1 ♂). Cat. Nos. 36,711 and 36,760.

Mithrax (Mithrax) tuberculatus Stimpson, 1860.

General Range: From Arena Bank in the Gulf of California to Panama.

Local Distribution: 4 specimens (Cat. No. 36,759) were taken from

a piece of coral (*Pocillopora ligulata*) which was brought up off Arena Bank (Station 136 D-33) from a depth of $2\frac{1}{2}$ fathoms.

Sex and Size: The 3 females were all ovigerous and measured from 15 to 17.5 mm. in length; the single male measured 24 mm.

Color in Life: Crimson to maroon, mottled ventrally with a varying amount of white. Chelipeds either pale cream except for crimson dactyls or mottled crimson and white, or entirely crimson. The color was deepest in the male.

Food: 2 stomachs contained large quantities of algae mixed with small amounts of coral detritus, bits of sponge and unidentifiable animal matter.

Breeding: The 3 females each carried from 375 to 525 eggs measuring from .5 to .6 mm. in diameter.

Habits: Bryozoans were attached to the carapaces of 2 specimens and a worm tube to a third.

Remarks: In 2 specimens there is a small accessory spine on one or both sides located in front of the last anterolateral spine.

This species has not been recorded previously north of Cape San Lucas.

Mithrax (Mithraculus) areolatus (Lockington), 1877.

General Range: San Diego, California; Gulf of California; Bay of Panama and Pearl Islands. Shallow water.

Local Distribution: 3 males (Cat. No. 36,866), measuring from 3.8 to 7 mm. in length, were taken from a piece of coral (*Pocillopora ligulata*), which was brought up off Arena Bank (Station 136 D-33) from a depth of $2\frac{1}{2}$ fathoms.

Telephrys cristulipes Stimpson, 1860.

General Range: From Arena Bank in the Gulf of California to Panama; Galápagos Islands.

Local Distribution: 9 specimens (Cat. No. 36,865) were taken from a piece of coral (*Pocillopora ligulata*) which was brought up off Arena Bank (Station 136 D-33) from a depth of $2\frac{1}{2}$ fathoms.

Sex and Size: The 6 females measured from 4.3 to 6.1 mm. in length, the 3 males from 4.6 to 8.5. Ovigerous females were 6 mm. long. All of the younger specimens were about as long as wide or a little longer, instead of being slightly wider than long.

Breeding: Of the 6 females, 3 were ovigerous. The eggs measured .28 mm. in diameter and numbered 170 in one case. In the others some of the zoeas had already hatched.

Stenocionops beebei Glassell, 1936.

(Plate IV, Figures 13-15).

General Range: Gulf of California. From 35 to 45 fathoms.

Local Distribution: 7 specimens were taken on Arena Bank (Station 136) between 35 and 45 fathoms on sandy and muddy bottoms.

Sex and Size: The series contains a single female, non-ovigerous, 56 mm. in length (the holotype), and 6 males measuring from 9.5 to 20 mm. in length (including the male paratype).

Color in Life: The holotype was dull pink.

Habits: All of the specimens were decorated with tiny sponges, hydroids and algae, the smaller specimens to a greater extent than the larger ones.

Remarks: For a description of this species, see *Zoologica*, XXI, No. 17,

p. 214. Mr. Steve Glassell, the author of the species, has examined the 5 small specimens in the collection which were isolated after the publication of the type description, and has designated them as metatypes. The holotype is deposited in the collections of the Department of Tropical Research of the New York Zoological Society, while the paratype and 3 metatypes are in those of the San Diego Society of Natural History.

Material: Station 136: D-13 (1 ♂), D-23 (1 ♀, 3 ♂), D-30 (2 ♂). Cat. Nos. 36,714 (holotype) and 36,928.

Stenocionops contigua (Rathbun), 1892.

General Range: Magdalena Bay, Lower California; Gulf of California. To a depth of 30 fathoms.

Local Distribution: A single young male (Cat. No. 36,850), 20.5 mm. in length, was taken in the Inez area (Station 142 D-1) at a depth of 30 fathoms on a bottom composed of coarse shelly sand with weed.

Habits: The crab was decorated sparsely with bits of weed and grains of sand.

Remarks: This species has not been recorded previously from below 21 fathoms.

Stenocionops macdonaldi (Rathbun), 1892.

General Range: Gulf of California; Bay of Panama. From 33 to 145 fathoms.

Local Distribution: A total of 13 specimens was taken on Arena Bank (Station 136) between 45 and 55 fathoms on muddy bottoms.

Sex and Size: The 12 females measured 61.5 to 81.5 mm. in length, the single male 37.5 mm. Ovigerous females ranged from 69.5 mm.

Color: Pink with olive brown pubescence. Chelae dark brown.

Food: Each of the 3 stomachs examined contained a little weed and a considerable amount of indeterminate animal matter.

Breeding: Several of the females were ovigerous. The eggs of an 81.5 mm. specimen measured .59 mm. in diameter and numbered about 36,000.

Remarks: This species has been known previously only from 7 specimens taken by the *Albatross*. The present series differs from the description in that the outer margins of the rostral horns tend to diverge widely instead of converge slightly, but they show variation in this respect even among themselves. The length of the rostrum of the larger specimens is contained 9 to 10 times in the total length, not 12 as in Rathbun's slightly larger (93 mm.) male type, while that of our 37.5 mm. young male is contained only 7 times in the length—i. e., it approximates the relative size of the rostrum in *S. triangulata* (Rathbun). In the latter species, which is known only from specimens up to 30 mm. long, the rostral length is contained 6 times in the length of the crab.

This young male of the present collection, although clearly referable to *S. macdonaldi* and not to *S. triangulata*, nevertheless lends further support to Rathbun's suggestion (1925, p. 461 ff.) that the two species are synonymous. While its hepatic spines are double on one side and triple on the other, as in typical *S. macdonaldi*, still the subsidiary spines are very small (they are absent in *S. triangulata*). Again, the hepatic region, instead of bulging prominently as in *S. macdonaldi*, protrudes only slightly more than in *S. triangulata*; in even our largest specimen the hepatic regions do not project quite as much as in Rathbun's figure of the slightly larger type of *S. macdonaldi*, so that it is evident that this characteristic develops with growth. The relatively greater length of the rostrum is, of course, typical of the young of many crabs. Finally, the range of *S. triangulata* is

similar to that of *S. macdonaldi*. Nevertheless, a still smaller intermediary specimen should be secured before the two species are actually synonymized.

Material: Station 136: D-7 (3 ♀), D-9 (1 ♀), D-17 (8 ♀), D-22 (1 ♂). Of these specimens 4 are preserved (Cat. No. 36,713).

Macrocoeloma villosum (Bell), 1836.

(Plate III, Figure 12).

General Range: From Santa Inez Bay in the Gulf of California to Ecuador. To a depth of at least 11 fathoms.

Local Distribution: A single young male (Cat. No. 36,352), 9.6 mm. in length, was taken from weed floating near Santa Inez Point.

Remarks: This specimen differs from the descriptions in having the postero-lateral spines directed very slightly backward instead of forward, while the pits between the protuberances of the carapace are only slightly vermiculated. All the specimens previously known, however, were over an inch in length—3 times the size of the present crab.

This species has not been recorded previously north of Cape San Lucas.

Microphrys branchialis Rathbun, 1898.

General Range: From Abreojos Point, Lower California, to the Gulf of California. From 12 to 48 fathoms.

Local Distribution: 2 specimens were taken from Arena Bank (Station 136) at 35 and 40 fathoms on bottoms composed of mud and of coarse sand with weed, respectively.

Sex and Size: The non-ovigerous female measured 10.1 mm. in length, the male 8.4 mm.

Color: The female, taken on the muddy bottom, was pinkish-olive with the manus and dactyls of the chelipeds pink.

Habits: In contrast with *M. platysoma*, this species is provided with few curved hairs, and our specimens carried no decoration whatever of weed or sand.

Material: Station 136: D-23 (1 ♀), D-30 (1 ♂). Cat. No. 36,715.

Microphrys platysoma (Stimpson), 1860.

General Range: From the western coast of Lower California and the Gulf of California to Panama. From low tide to at least 4½ fathoms.

Local Distribution: A total of 4 specimens was taken in the Inez area (Station 144 and the shore of Santa Inez Bay) between low tide and 2½ fathoms on sandy bottoms with weed.

Sex and Size: The 3 females measured 9, 12.4 (ovigerous) and 14 mm. in length, respectively; the single male 13.2 mm.

Color in Life: Our specimens agreed well with those described in Lockington's notes (*Proc. Calif. Acad. Sci.*, vol. 7, 1876 [1877], p. 66 [4]), but there was considerable variation: Carapace plain tan to reddish-brown; chelipeds creamy white above mottled with pink, or red marbled with white, a band of bright red usually present across base of fingers; underparts and ambulatories pale cream, sometimes mottled with pink or red.

Food: The stomach of the largest female held several amphipods, while that of the ovigerous specimen was crammed with seaweed.

Breeding: There was a total of 315 eggs, .54 mm. in diameter.

Habits: Each specimen was well decorated with grains of sand and bits of weed held in place chiefly by the curved hairs of carapace and appendages.

Material: Station 144: D-2 (2 ♀, 1 ♂). *Shore of Santa Inez Bay:* (1 ♀). Cat. No. 36,851.

Tyche lamellifrons Bell, 1836.

General Range: From the Gulf of California to Panama on sandy bottoms. To a depth of 29 fathoms.

Local Distribution: 2 specimens were taken from the Inez area (Stations 143 and 144) on sandy bottoms with weed at depths of 29 and 2½ fathoms respectively.

Sex and Size: The non-ovigerous female measured 24 mm. in length, the male 18.5 mm.

Color in Life: Although Bell (*Proc. Zool. Soc. London*, vol. 3, 1835 [1836], p. 173) recorded the color as dull, uniform brown which was paler beneath, both of our specimens were tinged strongly with pink.

Habits: Both specimens were covered with sponges and bristled with algae of several kinds, so that their outlines were entirely concealed. Even the ambulatories were decorated, and each specimen held between the rostral horns an especially large frond of seaweed.

Remarks: The present specimens increase the known depth range from 10 to 29 fathoms.

Material: Station 143: D-1 (1 ♂). Station 144: D-2 (1 ♀). Cat. No. 36,852.

Family Parthenopidae.

Parthenope (Platylambrus) exilipes (Rathbun), 1893.

General Range: From the west coast of Lower California and the southern part of the Gulf of California to Panama and the Galápagos Islands. From 20 to 80 fathoms.

Local Distribution: A total of 26 specimens was taken from Gorda Banks (Station 150) and Arena Bank (Station 136) between 20 and 75 fathoms on muddy and sandy bottoms.

Sex and Size: The 9 females measured from 17 to 24 mm. in length, the largest being ovigerous. The 17 males ranged from 7 to 30 mm.

Color in Life: Males: Carapace and chelipeds light yellow brown to olive brown marked with chestnut and light orange; ventral side of chelipeds salmon pink or orange with a violet spot at joint between merus and carpus; tips of dactyls white washed with red violet; ambulatories white banded with maroon or chestnut and tipped with grayish-brown. Female: Carapace usually darker and more reddish than in male. Eggs coral red.

Food: A 29.5 mm. male had eaten a very small crab of the same species; a second stomach held traces of another crab (species indeterminable); a third held a minute holothurian. The remainder of the 6 stomachs examined were empty.

Breeding: The single ovigerous female carried at least 8,000 eggs, almost all of which had already hatched, the shells being still attached to the pleopods. The unhatched eggs measured .32 mm. in diameter.

Habits: A specimen was kept alive in an aquarium for several days. It spent almost the entire time buried in the mud with only the eyes projecting.

Remarks: The tubercles of males were sharper than those of females, while the young specimens had the sharpest ones of all. This species has not been reported previously at less than 31 fathoms.

Material: Station 136: D-8 (1 ♀), D-18 (1 ♀), D-20 (2 ♀, 1 ♂), D-21 (1 ♀, 2 ♂), D-24 (1 ♂), D-26 (1 ♀, 1 ♂), D-27 (3 ♀, 1 ♂). Station 150: D-3

(1 ♂), D-4 (2 ♂), D-8 (5 ♂), D-9 (1 ♂), D-16 (2 ♂). Of these specimens 13 are preserved (Cat. Nos. 36,716 and 36,717).

Parthenope (Pseudolambrus) excavata (Stimpson), 1874.

(Plate V, Figures 16, 17).

General Range: From Santa Inez Bay in the Gulf of California to Panama.

Local Distribution: A single male (Cat. No. 36,853) was taken in the Inez area (Station 143 D-1) at a depth of 29 fathoms on a sandy bottom with weed.

Sex and Size: The measurements of this male are as follows: length 15, breadth 18, cheliped 28, right propodus 14.2, right manus 12.2 mm.

Remarks: Both of the specimens previously taken, the non-extant type from Manzanillo and the specimen from Panama, were over an inch long and both were females. The present young male agrees with the descriptions perfectly in general shape and appearance and in the tuberculation of the chelipeds. It disagrees markedly, however, in having long, sharp supra-orbital and branchial spines instead of low tubercles. Also, there are traces of another pair of long spines on the anterior mesogastric region and of a single spine on the cardiac prominence, all three being obviously broken off, but resembling low tubercles in their present condition. Nevertheless, since tubercles are normally sharper and more spine-like in young males of this genus than in older specimens of the opposite sex, and since it is possible that some of the spines of the previously recorded females were broken off and hence resembled tubercles, just as they do in the present case, it appears that the creation of a new species with the present specimen as holotype would be unjustified.

Parthenope (Pseudolambrus) triangula (Stimpson), 1860.

(Plate V, Figure 18).

General Range: Known only from Cape San Lucas, Lower California.

Local Distribution: A single male (Cat. No. 36,718), measuring 8.4 mm. in length by 10 mm. in breadth, was taken in San Lucas Bay (Station 135 D-20) at a depth of 3 fathoms on a sandy bottom.

Remarks: This species was previously known only from the non-extant type specimen, a female measuring 14 mm. in length by 17.5 mm. in breadth, which was also taken at San Lucas. Our specimen differs from it in having the antero-branchial region slightly more prominent, so as almost to form an angle as in *P. (P.) excavata*. Due to its small size, this male is not proposed as a neotype.

Mesorhoea bellii (A. Milne Edwards), 1878.

General Range: From Abrejos Point on the western coast of Lower California and from the Gulf of California to Panama Bay. From 9½ to 71 fathoms.

Local Distribution: A total of 19 specimens was taken from San Lucas Bay (Station 135), Arena Bank (Station 136) and the Inez area (Stations 141, 142 and 143) between 13 and 45 fathoms on sandy or muddy (usually sandy mud) bottoms.

Sex and Size: The 12 females measured between 9.7 and 14 mm. in length (2 specimens, each 14 mm. long, were ovigerous). The 7 males ranged from 7.5 to 14.5 mm.

Food: Of the 6 stomachs examined, 3 contained bottom detritus, 1 a worm and 2 were empty.

Breeding: The eggs were .27 mm. in diameter and numbered about 2,600 on each of the ovigerous females.

Remarks: As in the analogous Atlantic species, *M. sexspinosa*, there is considerable variation in the size of the teeth at the branchial angle of the carapace and on the posterior margin. The length of the rostral lobe is also variable. In general, old males have the longest spines and teeth and the smallest rostral lobes, while the opposite is true of young females.

Material: Station 135: D-11 (1 ♂), D-26 (1 ♀). Station 136: D-14 (2 ♀). Station 141: D-4 (1 ♀). Station 142: D-2 (1 ♀), D-3 (1 ♀). Station 143: D-2 (1 ♀, 1 ♂), D-3 (2 ♀, 3 ♂), D-4 (1 ♀), D-5 (2 ♀, 2 ♂). Cat. Nos. 36,719, 36,720, 36,854, 36,855, 36,856.

Superfamily Brachyrhyncha.

Family Portunidae.

Ovalipes punctatus (de Haan), 1833.

General Range: Cape San Lucas, Lower California; Peru; Chile; Uruguay; Argentina; South Africa; Japan; China; Australia; New Zealand.

Local Distribution: The manus (Cat. No. 36,924) of a cheliped was taken from the stomach of a long-snouted shark, *Carcharias velox*, April 3, 1936, in San Lucas Bay (Station 135). This is the first record of the crab's occurrence on the eastern Pacific coast north of Peru.

Portunus (Achelous) iridescens (Rathbun), 1893.

General Range: West coast of lower California; Gulf of California. From 18 to 112 fathoms.

Local Distribution: A total of 447 specimens was taken off Cape San Lucas (Station 151), on Arena Bank (Station 136) and in the Inez area (Stations 142, 143, 146 and 147) between 30 and 60 fathoms. The great majority occurred on mud bottoms, with only a few on sand, shelly or rocky bottoms with weed.

• *Sex and Size:* The 264 males, half again as numerous as the females, measured between 6.3 and 26 mm. in length. Females ranged from 13.5 to 26.5 mm., with ovigerous specimens from 17 to 25 mm. Detailed measurements of the 2 largest specimens in the collection are as follows: Female, length 26, breadth 52, breadth in front of lateral spines 38, fronto-orbital breadth 19.5, length of cheliped 62, length of carpal spine 12.5 mm. Male, length 26, breadth 53, breadth in front of lateral spine 39, fronto-orbital breadth 19, length of cheliped 80, length of carpal spine 32.

Color in Life: Carapace olive gray, the ridges and prominences being chestnut or maroon; lateral spines sometimes yellow orange, always tipped with white; underparts whitish; eyes olive green; palps of outer maxillipeds opalescent; chelipeds paler than carapace—cream-colored to light sienna, the ridges colored as on the carapace; short spines of chelipeds also maroon tipped with white and orange; carpal spines usually reddish-orange tipped with white, the fringe of hair being pale Indian red; ambulatories whitish spotted with dull yellow brown, barred with maroon and tipped with light orange red; swimmerets each tipped with a characteristic reddish-purple ocellus with a white center. In the smallest specimens (up to 14 mm. in length) the general color is very pale, but even in the youngest the ocelli are visible. The chelipeds of adult males are much redder than those of other specimens. Eggs coral red.

Food: 12 stomachs contained material distributed as follows: Stomachs with sand and algae, 2; with sand alone, 1; with pebbles, bits of shell and minute snails, 1; with amphipods, 1; with worm, 1; with echinoderm (probably sea-urchin), 1; empty, 5.

Breeding: About three-fifths of the females were ovigerous. The eggs measured .32 mm. in diameter. Three counts gave totals ranging from about 13,000 (on a female measuring 17 mm. in length) to about 21,500 (on a 23 mm. specimen).

Habits: In an aquarium a specimen lived several days, remaining buried under a thin film of mud.

Remarks: In the adult males of the present collection, the carpal spine did not quite reach the tip of the manus.

Material: Station 136: D-2 (1 ♂), D-4 (20 ♀ and ♂), D-7 (17 ♀, 8 ♂), D-8 (5 ♀, 1 ♂), D-9 (9 ♀, 9 ♂), D-10 (5 ♀, 9 ♂), D-13 (1 ♂), D-14 (3 ♀, 9 ♂), D-15 (9 ♀, 14 ♂), D-16 (17 ♀, 30 ♂), D-17 (15 ♀, 70 ♂), D-18 (33 ♀, 37 ♂), D-20 (18 ♀, 19 ♂), D-21 (2 ♀, 4 ♂), D-22 (27 ♀, 28 ♂), D-24 (2 ♂), D-26 (2 ♀), D-31 (1 ♂), D-32 (3 ♀). Station 142: D-3 (5 ♀, 6 ♂). Station 143: D-2 (2 ♂). Station 146: D-1 (1 ♀, 3 ♂). Station 147: D-2 (1 ♀). Station 151: D-1 (1 ♀). Cat. Nos. 36,724, 36,857, 36,858, 36,859, 36,860.

Portunus (Achelous) minimus Rathbun, 1898.

General Range: Gulf of California from Tiburon Island to the Tres Marias Islands. From 4 to 50 fathoms.

Local Distribution: A total of 19 specimens was taken from Arena Bank (Station 136) between 34 and 50 fathoms, on sandy or muddy bottoms, sometimes with weed.

Sex and Size: The 12 females measured between 12 and 17 mm. in length, with ovigerous specimens between 14.5 and 17 mm. The 7 males ranged from 5.3 to 18.5 mm. Detailed measurements of the two largest specimens in the collection are as follows: Ovigerous female, length 17, breadth including spines 26, fronto-orbital width 15, length of cheliped 35. Male, length 18.5, breadth including spines 29, fronto-orbital width 16, length of cheliped 48.5.

Color in Life: Reddish- or purplish-brown blotched with darker brown; chelae banded with purple. Eggs watermelon pink, coral red or orange.

Food: 6 stomachs contained material distributed as follows: with shrimps, 1; with amphipods, 1; with indeterminate crustaceans, 1; with indeterminate animal matter, 3.

Breeding: Half of the females were ovigerous. The eggs, .32 mm. in diameter, ranged in number from about 12,500 on a 14.5 mm. crab to about 14,500 on a 17 mm. crab.

Remarks: In the young the outer frontal teeth are less tooth-like and projecting, their inner margins being long with a gentle slope.

This species has not been recorded previously below 40 fathoms.

Material: Station 136: D-1 (1 ♀), D-5 (2 ♂), D-6 (2 ♀, 1 ♂), D-12 (1 ♀), D-23 (5 ♀), D-24 (1 ♀), D-30 (2 ♀, 4 ♂). Cat. No. 36,722.

Portunus (Achelous) pichilinguei Rathbun, 1930.

General Range: From Magdalena Bay to the head of the Gulf of California. From 3 feet to 33 fathoms.

Local Distribution: A total of 62 specimens was taken from the shore of Magdalena Bay, from San Lucas Bay (Station 135) and from the Inez area (Stations 141, 142 and 144), between 3 feet and 33 fathoms on various types of bottoms, usually more or less sandy.

Sex and Size: The 23 males, only three-fifths as numerous as the females, measured between 3.2 and 14 mm. in length. Females ranged from 4.6 to 13.5 mm., with ovigerous specimens from 7.6 to 10 mm.

Color in Life: This species varies considerably in accordance with its

surroundings. The carapace of specimens taken on sandy bottoms was mottled with a fine pattern of brown and grayish-white, and a few small spots of orange. Specimens taken on bottoms with pink or purplish coral and algae, on the other hand, had the carapace coral pink with mottlings of dark reddish-brown or with lighter brown and white. Legs same color as background of carapace, more or less mottled with buff and brown, or barred with pinkish buff, depending on the bottom. Chelae with one or two conspicuous dark bands, one always near the base and sometimes another near the tip. Swimming legs sometimes plain buff (on crabs from sandy bottoms). The males found on both backgrounds have each a bright pink or orange spot on the hepatic region. Underparts pure white. Eggs rose red.

Food: 3 specimens from San Lucas Bay had, respectively, sand, a larval fish and crustacean remains in their stomachs, while 3 specimens from Santa Inez Bay contained the following: with a sponge, a shrimp and the oxystomatous crab, *Randallia americana*, 1; with 2 amphipods and *Randallia americana*, 1; with a single crustacean, 1.

Breeding: Only 6 of the 39 females were ovigerous. The eggs of a medium-sized specimen numbered about 2,100.

Habits: Specimens from bottoms composed of crushed shell and sand sought that material when placed in an aquarium containing samples of various bottoms. The crabs matched the chosen background perfectly in color.

Remarks: Although the lateral spine in all specimens is considerably longer than twice the length of the preceding tooth, so that there is no possibility of confusion with *P. minimus*, in a few specimens the spine is not quite as long as the width of the 3 preceding teeth, as recorded in Rathbun's description of her specimens (1930, p. 78). The outer orbital teeth go through the same developmental phases as in *P. minimus* (see p. 67).

This species has previously been recorded from between 7 and 29 fathoms, so that the present series (from 3 feet to 33 fathoms) increases the known vertical range slightly in both directions.

Material: *Shore of Madalena Bay* (3 feet): (6 ♀). *Station 135*: D-1 and D-9 to D-26, incl. (26 ♀, 16 ♂). *Station 141*: D-4 (1 ♂). *Station 142*: D-1 (6 ♀, 5 ♂), D-2 (1 ♂). *Station 144*: D-2 (1 ♀). Cat. Nos. 36,235, 36,236, 36,723, 36,880, 36,881.

Portunus (Achelous) tuberculatus (Stimpson), 1860.

General Range: From Cape San Lucas, Lower California, to Panama. From 3 to 29½ fathoms.

Local Distribution: 5 specimens were taken from San Lucas Bay (*Station 135*) between 3 and 6 fathoms on sandy bottoms.

Sex and Size: The single ovigerous female measured 9.6 mm. in length, 2 young females 9.9 and 10.6 mm., and 2 males 8.3 and 8.9 mm.

Food: The stomachs of 2 specimens contained indeterminable animal matter.

Breeding: The ovigerous female had about 5,400 eggs measuring .27 mm. in diameter.

Material: *Station 135*: D-1 (2 ♀, 2 ♂), D-19 (1 ♀). Cat. No. 36,725.

Callinectes bellicosus (Stimpson), 1859.

General Range: From Point Loma, California, to the Gulf of California.

Local Distribution: 2 young males (Cat. No. 36,879), measuring 12.5 and 14 mm. in length respectively, were taken off Santa Inez Point in floating weed over shallow water.

Family Atelecyclidae.

Pliosoma parvifrons Stimpson, 1860.

General Range: Known only from Cape San Lucas and, questionably, from Carmen Island.

Local Distribution: 5 males, measuring from 4.9 to 17.5 mm. in length, were taken from San Lucas Bay (Station 135) between 6 and 20 fathoms on a sandy bottom.

Color: Plain buff.

Food: Bits of algae; sand.

Material: Station 135: D-1 (2 ♂), D-16 (1 ♂), D-26 (2 ♂). Cat. No. 36,726.

Family Xanthidae.

Carpilodes cinctimanus (White), 1847.

General Range: From Arena Bank in the Gulf of California to the Galápagos Islands; South Sea Islands; Japan and Australia to the Gulf of Aden.

Local Distribution: 3 males (Cat. No. 36,761), measuring 5.2, 5.4 and 12.2 mm. in length, respectively, were taken off Arena Bank (Station 136 D-33) at a depth of 2½ fathoms in coral (*Pocillopora ligulata*).

Color in Life: This series shows the development of color with age: The largest specimen was entirely burnt orange with the middle of each lateral margin tipped with white; the characteristic band on the inner side of the palm was pale gray. The 5.4 mm. specimen was bright orange, the mid-lateral margins tipped with white; chelae dark tipped with white, but with no trace of a band on the inner side of the palm. The carapace and underparts of the 5.2 specimen were pure white; the chelipeds were orange except for dark and white dactyls; no trace of a band on inner margin of palm; ambulatories bright orange.

Remarks: A fourth specimen, measuring only 2.7 mm. in length, was taken in the same piece of coral with the above specimens and probably belongs to this species. It differs in having a relatively broader front, the fronto-orbital distance being slightly more, instead of less, than half the greatest breadth. Also, the surface of the carapace is slightly granulate instead of punctate, but this, too, can easily be an age characteristic. In preservative the specimen is entirely white with narrow, vertical, widely separated orange stripes on the carapace; chelae gray tipped with white; no trace of band on inner surface of manus.

Actaea crockeri Glassell, 1936.

(Plate VI, Figure 1).

General Range: Gulf of California. At 34 fathoms.

Local Distribution: A single specimen, the male holotype (Cat. No. 36,731), was taken on Arena Bank (Station 136 D-5) at a depth of 34 fathoms on a bottom composed of rocks and sand with weed.

Remarks: For a description of this species, see *Zoologica*, XXI, No. 17, p. 215. The holotype is deposited in the collections of the Department of Tropical Research of the New York Zoological Society.

Actaea sulcata Stimpson, 1860.

General Range: From Arena Bank in the Gulf of California to the Pearl Islands, Panama. From 2½ to 15 fathoms.

Local Distribution: 2 immature females (Cat. No. 36,762), measuring

8.4 and 8.9 mm. in length were taken off Arena Bank (Station 136 D-33) in coral (*Pocillopora ligulata*) at a depth of 2½ fathoms.

Color in life: Carapace and all legs clear orange-red in larger specimen; orange-red mottled with white in smaller one. Underparts white. Chelae jet black tipped with white.

Food: Indeterminable animal matter.

Glyptoxanthus felipensis Rathbun, 1933.

(Plate VI, Figures 20, 21).

General Range: From San Felipe to Santa Inez Bay in the Gulf of California.

Local Distribution: A single male (Cat. No. 36,885), 8.4 mm. in length, was taken in the Inez area (Station 144 D-2) at a depth of 2½ fathoms on a sandy bottom with weed.

Remarks: This species was known previously only from the 29 mm. male holotype from San Felipe in the Gulf of California (Rathbun, *Proc. Biol. Soc. Washington*, vol. 46, p. 147, 1933). The present young specimen agrees well with the description.

Daira americana Stimpson, 1860.

General Range: From the southern part of the Gulf of California to Ecuador.

Local Distribution: 15 non-ovigerous females (Cat. No. 36,763), measuring from 3.4 to 24 mm. in length were taken from coral (*Pocillopora ligulata*) off Arena Bank (Station 136 D-33) at a depth of 2½ fathoms.

Color in Life: Carapace and chelipeds dark brown, the hairs grayish-brown; ventral side paler except pterygostomian region, which is dark brown also; a longitudinal very pale streak down mid-line of abdomen. Antennules, palps of maxillipeds, inner (anterior) surface of chelipeds, entire surface of ambulatories and outer margins of abdomen brownish tinged with carmine.

Food: 4 stomachs contained seaweed mixed with grains of sand.

Medaeus lobipes Rathbun, 1898.

General Range: From Santa Inez Bay in the Gulf of California to the Bay of Panama; Galápagos Islands. From 5½ to 33 fathoms.

Local Distribution: 1 male (Cat. No. 36,861), measuring 16 mm. in length by 25 in breadth, was taken from the Inez area (Station 143 D-4) at a depth of 25 fathoms on a sandy bottom.

Color in Life: Carapace pale tan mottled with brownish-orange; chelae rich chestnut.

Food: The stomach was crammed with sand.

Remarks: This is the first time this species has been reported north of Cape San Lucas.

Eurypanopeus planissimus (Stimpson), 1860.

General Range: West coast of Mexico, including both east and west coasts of Lower California. Low tide zone and shallow water.

Local Distribution: A total of 6 specimens was taken from the shore of Magdalena Bay and from that of Santa Inez Bay, from the surface (in floating weed) to a depth of 3 feet.

Sex and Size: The series consists of a single ovigerous female measuring 7.9 mm. in length by 12.6 mm. in breadth; 1 young female 5 mm. in

length; and 4 males from 3.2 to 9.2 mm. in length; the largest male measures 14.5 mm. in breadth.

Food: The stomachs of 3 specimens, chosen from both the Magdalena Bay and the Santa Inez Bay material, contained algae.

Breeding: The ovigerous female, taken from Magdalena Bay, carried about 1,450 eggs each measuring .38 mm. in diameter.

Remarks: This species has not previously been taken in the Gulf of California north of La Paz.

Material: *Shore of Magdalena Bay:* (1 ♀, 1 ♂); *in floating weed, Santa Inez Point:* (1 ♀, 2 ♂); *in old augur shell, shore of Santa Inez Bay:* (1 ♂) (uncalcified). Cat. Nos. 36,862, 36,886, 36,887.

Micropanope areolata Rathbun, 1898.

General Range: Southern California and Lower California, including the Gulf, to a depth of 11 fathoms.

Local Distribution: A single male (Cat. No. 36,888), measuring 7.2 mm. in length by 10.3 mm. in breadth, was taken in the Inez Area (Station 144 D-4) between 1½ and 4 fathoms, on a sandy bottom with weed.

Micropanope nitida Rathbun, 1898.

General Range: Gulf of California; 7 to 45 fathoms.

Local Distribution: A single male (Cat. No. 36,730), measuring 6.4 mm. in length, was taken on Arena Bank (Station 136 D-16) at a depth of 45 fathoms, on a sandy-mud bottom with weed.

Remarks: This species has never before been taken below 10 fathoms. Mr. Steve A. Glassell of the San Diego Museum of Natural History has kindly checked the identification of this specimen.

Micropanope polita Rathbun, 1893.

General Range: From Magdalena Bay, Lower California, and the southern part of the Gulf of California to Panama; Galápagos Islands. From 20 to 66 fathoms.

Local Distribution: A total of 39 specimens was taken from Arena Bank (Station 136) and the Inez area (Station 147) between 35 and 50 fathoms on both sandy and muddy bottoms.

Sex and Size: The series contains 12 females, measuring from 2.6 to 6.2 mm. in length (ovigerous females from 3.1 to 3.9 mm.), and 27 males, measuring from 3.2 to 6 mm.

Color in Alcohol: After 4 months in preservative, the specimens were found to be exceedingly variable, even when taken in the same dredge. The range was from dark brown through various shades of red and red mottled with white to pure creamy white. Age and sex apparently were not contributing factors.

Food: 3 stomachs all contained remains of amphipods; 3 others held unidentifiable organic remains.

Breeding: 5 of the 12 females were ovigerous, carrying between 25 and 60 eggs .27 mm. in diameter.

Remarks: The entire series of specimens from Arena Bank (Station 136), numbering all but 2 in the collection, were referred to this species by Mr. Steve A. Glassell who kindly examined them for me. They form an exceedingly variable group. The 26 specimens from Station 136 D-30 are on the whole more typical than the others, and run smaller in size; the bottom in this locality was composed of coarse sand with weed. The others, chiefly from muddy bottoms, have the palms of the chelae almost entirely rough,

while the amount of granulation on the anterior part of the carapace is very variable. The variations in color have already been remarked.

This species has not been reported previously from the Gulf of California.

Material: Station 136: D-1 (1 ♂), D-12 (1 ♀), D-13 (1 ♂), D-21 (1 ♀, 1 ♂), D-23 (3 ♀), D-26 (1 ♂), D-27 (2 ♂), D-30 (7 ♀, 19 ♂). Station 147: D-2 (2 ♂). Cat. Nos. 36,728, 36,729, and 36,889.

Micropanope xantusii (Stimpson), 1871.

General Range: From the southern part of the Gulf of California to Maria Madre Island, Mexico; Galápagos Islands. In shallow water.

Local Distribution: 14 specimens (Cat. No. 36,764) were taken off Arena Bank (Station 136 D-33) at a depth of 2½ fathoms in coral (*Pocillopora ligulata*).

Sex and Size: The 5 females in the series measured from 3.2 to 7.2 mm. in length, the 9 males from 2.7 to 6 mm.

Food: 2 stomachs each contained both algae and sand.

Breeding: The single ovigerous female, 6.4 mm. long, carried 725 eggs .3 mm. in diameter; the eggs were ready to hatch.

Pilumnus pelagius Glassell, 1936.

(Plate VII, Figures 22, 23).

General Range: Gulf of California at 45 fathoms.

Local Distribution: 3 specimens including the holotype were taken on Arena Bank (Station 136) at 45 fathoms on a muddy bottom.

Remarks: For a description of this species, see *Zoologica*, XXI, No. 17, p. 215. The holotype is deposited in the collections of the Department of Tropical Research of the New York Zoological Society, the paratype in those of the San Diego Society of Natural History.

Pilumnus townsendi Rathbun, 1923.

General Range: The west coast of Mexico from Magdalena Bay and the southern part of the Gulf of California to Manzanillo; Galápagos Islands. From 1½ to 51 fathoms.

Local Distribution: A total of 4 specimens was taken from the Inez area (Stations 141 and 144) between 1½ and 13 fathoms on bottoms composed of sand or crushed shell, always with weed.

Sex and Size: The series consists of 2 non-ovigerous females, measuring 6.2 and 13.2 mm. in length, and 2 males, 8.9 and 12.6 mm. in length.

Food: 2 stomachs contained algae, and sand and algae, respectively.

Remarks: In 3 of the 4 specimens, 1 or both frontal lobes have 4 instead of 3 spines.

Material: Station 141: D-1 (1 ♀), D-2 (1 ♀). Station 144: D-4 (1 ♂), D-6 (1 ♂). Cat. Nos. 36,890 and 36,891.

Heteractaea lunata (Milne Edwards & Lucas), 1843.

General Range: From San Diego, California, to Valparaiso, Chile. From between tide marks to 10 fathoms.

Local Distribution: 5 males (Cat. No. 36,768), measuring from 2.7 to 7.3 mm. in length, were taken off Arena Bank (Station 136 D-33) at a depth of 2½ fathoms in coral (*Pocillopora ligulata*).

Food: 2 stomachs contained algae.

Domecia hispida Eydoux and Souleyet, 1842.

General Range: Western Atlantic from South Carolina to Brazil; eastern Atlantic, Indian and western and eastern Pacific Oceans; Gulf of California to Panama. Shallow water, among sponges, under stones and in corals.

Local Distribution: 23 specimens (Cat. No. 36,765) were taken off Arena Bank (Station 136 D-33) at a depth of $2\frac{1}{2}$ fathoms in coral (*Pocillopora ligulata*).

Sex and Size: The 10 females in the series measured between 4.1 and 9.3 mm. in length, ovigerous specimens ranging from 6.7 to 9.3 mm.; the 13 males measured between 3 and 8.3 mm.

Food: 4 stomachs contained indeterminable organic matter.

Breeding: 4 of the 10 females were ovigerous, carrying from 585 to 1,050 eggs measuring .3 mm. in diameter.

Trapezia cymodoce ferruginea Latreille, 1825.

General Range: From the southern part of the Gulf of California to Panama; Revilla Gigedos Islands; Galápagos Islands; Indo-Pacific region to the Red Sea.

Local Distribution: 162 specimens (Cat. No. 36,767) were taken off Arena Bank (Station 136 D-33) at a depth of $2\frac{1}{2}$ fathoms in coral (*Pocillopora ligulata*).

Sex and Size: The series contained 87 females measuring from 2.6 to 14.3 mm. in length (ovigerous specimens ranging from 4 to 14.3 mm.) and 75 males, measuring from 3.2 to 16.5 mm.

Color in Life: The specimens varied in general color from orange rufous to grenadine red (by Ridgway's Color Standards), adult males being usually the brightest.

Food: An examination of 12 stomachs showed that 11 contained worms, while 1 held traces of bottom detritus.

Breeding: 61, or almost two-thirds, of the females were ovigerous. They carried from 48 and 61 (on the smallest specimens) to about 2,350 eggs, measuring from .38 to .43 mm. in diameter. Although the size range of ovigerous females (from 4 to 14.3 mm. in length) was so great, the specimens were well distributed throughout this range, no one size predominating noticeably in number.

Remarks: This species has not been reported previously off the eastern Pacific coast north of the Revilla Gigedos Islands.

Trapezia digitalis Latreille, 1825.

General Range: From Arena Bank in the Gulf of California to Panama; from the Red Sea to the Indo-Pacific region.

Local Distribution: 25 specimens (Cat. No. 36,766) were taken off Arena Bank (Station 136 D-33) at a depth of $2\frac{1}{2}$ fathoms in coral (*Pocillopora ligulata*).

Sex and Size: The series contains 12 females measuring from 3.8 to 10.4 mm. in length (ovigerous specimens ranging from 6.2 to 10.4 mm.), and 13 males, measuring from 3.7 to 11.7 mm.

Color in Life: Dorsal surface rich chocolate brown to chestnut brown, except for the palms and dactyls of the ambulatories which are usually bright chestnut red.

Food: An examination of 6 stomachs showed that 5 contained worms while 1 held traces of bottom detritus.

Breeding: 7 of the 12 females in the series were ovigerous. The eggs were found to number from 72 to about 950, and measured from .32 to .38 mm. in diameter.

Remarks: The lateral tooth is well developed in the young. This species has not been recorded previously on the eastern Pacific coast north of Cape San Lucas.

Quadrella nitida Smith, 1869.

General Range: From the southern part of the Gulf of California to Panama. From 6 to 75 fathoms.

Local Distribution. A total of 26 specimens was taken from Arena Bank (Station 136) and Gorda Banks (Station 150) between 35 and 75 fathoms on bottoms ranging from sandy to muddy, but always in association with gorgonids.

Sex and Size: The series contains 12 females measuring from 6.8 to 10.2 mm. in length and 14 males measuring from 5.1 to 8.9 mm.

Color in Life; Habits: Carapace, ambulatories and underparts pure white; chelipeds white or variously colored with shades of red, yellow or orange; usually a gray, brown or black bar across base of chelae.

The color of these crabs shows an amazing correlation with their mode of life. Every specimen was taken in association with gorgonids, most frequently a species (*Muricea miser* Verrill) which was either entirely white or with the tips of the branches brightly colored, the shade varying in different specimens from bright golden yellow through peach-colored to bittersweet orange and flame scarlet. The crabs, still alive, were often found clinging to the branches with their chelae so tightly that they could not be dislodged except by breaking off the chelipeds.

The remarkable part of the association was this: In almost every case, the crabs which were found on all-white gorgonids were entirely white themselves (except, sometimes, for a dark, typically xanthid bar across the chelae), while those clinging to specimens with the branch tips colored were white except for the chelipeds (or, sometimes, the manus and dactyls only) which always matched the shade of the gorgonid fronds more or less perfectly. Moreover, the crabs almost always clung to the branches in such a position that the white carapace and ambulatories were surrounded by the white basal parts of the branches, while the colored chelipeds were among the colored outer tips. In several examples an all-white crab was found in a gorgonid with colored tipped branches, but each of these clung to the white central portion of the coral.

On 4 occasions, single pairs were found close together in the same gorgonid treelet, 3 of the females being ovigerous. In 2 of these pairs, both male and female were completely white on an all-white gorgonid; in the other 2 pairs, either the male or the female had colored chelipeds paler than those of its mate, the outer fronds of the gorgonid being colored in both cases.

Only a single specimen, the carapace white as always, was taken on a completely colored gorgonid.

Although these crabs were all caught at depths (210 to 450 feet) at which all of the red rays and most of the yellow rays of the spectrum are entirely absent, so that these shades would appear grayish or black to our eyes, nevertheless, they would stand out to a certain extent against the lighter gray of pure white objects, so that the color patterns of *Quadrella* are evidently an example of protective coloration.

Food: An examination of 10 stomachs showed that 5 contained worms, and 4 brittle stars, while 1 was empty. Both worms and brittle stars were often found in the branches of the same gorgonids with the crabs.

Breeding: 6 of the dozen females taken were ovigerous; they carried from 420 to 1,000 eggs measuring between .32 and .38 mm. in diameter.

Remarks: Some specimens have 9 or 10 spines instead of only 6 to 8 on the merus of the chelipeds.

This species has not been reported previously below 31 fathoms.

Material: Station 136: D-1 (1 ♂), D-12 (1 ♀), D-23 (1 ♀, 2 ♂), D-24 (3 ♀, 1 ♂), D-26 (2 ♀, 4 ♂). Station 150: D-9 (1 ♀), D-10 (3 ♀, 5 ♂), D-16 (1 ♀, 1 ♂). Cat. Nos. 36,394, 36,732 and 36,733.

Family Goneplacidae.

Chasmocarcinus ferrugineus Glassell, 1936.

(Plate VII, Figure 24).

General Range: Gulf of California. At 45 fathoms.

Local Distribution: 3 specimens were taken on Arena Bank (Station 136 D-21) at a depth of 45 fathoms on a muddy bottom.

Color in Life: Reddish-brown; carpus, manus and dactyls of chelipeds white.

Remarks: A description of this species will be found in *Zoologica*, XXI, No. 17, p. 216. The holotype (Cat. No. 36,735) is deposited in the collections of the Department of Tropical Research of the New York Zoological Society, the paratype in those of the San Diego Society of Natural History.

Chasmocarcinus latipes Rathbun, 1898.

General Range: Cedros Island and Magdalena Bay, both off the west coast of Lower California. From 38 to 51 fathoms.

Local Distribution: 9 specimens were taken off Cedros Island (Station 126) between 38 and 40 fathoms on muddy bottoms.

Sex and Size: The collection contains 5 non-ovigerous females, measuring between 11 and 12 mm. in length, and 4 males, between 9 and 14.5 mm. in length.

Color in Life: Carapace and chelipeds grayish-white, center of carapace pink; basal segments of all specimens usually brown. Pubescence brown.

Remarks: This species has been known previously from a single female taken in Magdalena Bay. There is no sexual variation, and the specimens agree well with the original description.

Material: Station 126: D-1 (1 ♂), D-2 (5 ♀, 1 ♂), D-4 (2 ♂). Cat. No. 36,893.

Family Cymopoliidae.

Cymopolia cortezi, sp. nov.

(Plate VIII, Figure 25).

Type: Male, holotype; Cat. No. 36,895, Department of Tropical Research of the New York Zoological Society; Station 147, Dredge 2, from Santa Inez Bay in the Gulf of California, 26° 57' 30" N. Lat., 111° 48' 30" W. Long.; 60 fathoms; bottom composed of mud and crushed shell; April 17, 1936; 4-foot Blake dredge; collected by William Beebe on Templeton Crocker's yacht *Zaca*.

Diagnosis: Front with 2 large, non-emarginate, triangular teeth; 2 sharp antero-lateral teeth; last leg reaching beyond merus of third ambulatory; distal lobe of merus of ambulatories acute.

Description: Carapace not much broader than long, moderately convex with 2 large, acute, antero-lateral teeth besides orbital tooth; both of these teeth point obliquely outward, their bases nearly touching; first tooth slightly broader than second. Tubercles of carapace conspicuous, trending forward, becoming increasingly laminate transversely toward posterior part of carapace; intervening spaces almost smooth except for a few small granules and hairs, the latter being more numerous posteriorly. Ridge above

posterior margin crenulate with 4 large tubercules and 4 intervening small ones.

Entire front divided by a deep median notch, slightly wider than deep, into 2 large, triangular teeth, their apices forming almost perfect right angles. First sinus of supraorbital margin narrowly U-shaped, the second broadly V-shaped; middle tooth subacute, equilaterally triangular; outer tooth acute, lower and narrower than middle tooth, and separated from outer tooth of orbit by a broad, triangular notch. Outer tooth of orbit directed obliquely forward, the inner margin entirely straight, the outer straight except for the slightly convex distal portion. Both suborbital sinuses V-shaped, the outer narrowly, the inner broadly. Outer suborbital lobe very convex, almost triangular, its inner margin nearly twice as long as its outer one. Inner suborbital lobe rudimentary, very low, with an oblique, slightly convex margin half concealed by the pterygostomian lobe. The latter is strongly developed, with a sinuous margin ending in a small, blunt, tooth-like projection, far in advance of the outer suborbital lobe.

Chelipeds slender, the right one slightly the longer with its manus moderately tumid. Tips of fingers crossing.

First ambulatory leg reaching middle of merus of second leg; second leg about $1\frac{2}{3}$ times the maximum width of carapace. Merus of ambulatories each with a low dorsal crest ending in an acute lobe; carpus with a low dorsal crest with 2 subacute lobes, basal and distal; propodus slightly enlarged distally, its low dorsal crest extending both basally and distally in a small, horizontal tooth. Last leg reaching slightly beyond end of merus of third leg.

Measurements: Male holotype: Length of carapace, 7.9 mm.; breadth of carapace including second antero-lateral teeth, 10.1 mm.; breadth of carapace excluding second antero-lateral teeth, 9.4 mm.; length of first ambulatory, 12 mm.; length of second ambulatory, 16.8 mm.

Material Examined: The male holotype.

Remarks: This proposed species is allied to *Cymopolia obesa* A. Milne Edwards and to *Cymopolia tuberculata* Faxon. It differs from both in the character of the front and of the antero-lateral teeth, but has more characters in common (namely, the length of the last leg and the number of antero-lateral teeth) with *C. obesa* from the Gulf of Mexico than it has with *C. tuberculata* from the Bay of Panama.

Cymopolia lucasii (Rathbun), 1898.

General Range: Cape San Lucas and southern part of the Gulf of California. From 31 to 60 fathoms.

Local Distribution: 2 specimens were taken from Arena Bank (Station 136) and Gorda Banks (Station 150), respectively, between 50 and 60 fathoms on muddy and sandy bottoms.

Sex and Size: The non-ovigerous female from Arena Bank measured 13.6 mm. in length, the male from Gorda Banks 11.5 mm.

Remarks: This species has been known previously only from a series of 7 specimens taken by the *Albatross* off Cape San Lucas at a depth of 31 fathoms.

Material: Station 136: D-27 (1 ♀). Station 150: D-9 (1 ♂). Cat. Nos. 36,738 and 36,739.

Cymopolia zacae Glassell, 1936.

(Plate VIII, Figure 26).

General Range: Gulf of California. At 45 fathoms.

Local Distribution: A single specimen, the male holotype, was taken on Arena Bank (Station 136) at a depth of 45 fathoms on a muddy bottom.

Remarks: For a description of this species, see *Zoologica*, XXI, No. 17, p. 217. The holotype is deposited in the collections of the Department of Tropical Research of the New York Zoological Society.

Cymopolia zonata Rathbun, 1893.

General Range: Magdalena Bay, Lower California, and the Gulf of California. From $\frac{1}{2}$ to 40 fathoms.

Local Distribution: A total of 49 specimens was taken from the shore of Magdalena Bay, from Arena Bank (Station 136) and from the Inez area (Station 142) between $\frac{1}{2}$ and 40 fathoms, on sandy and muddy bottoms, usually with weed.

Sex and Size: The series contains 19 females measuring between 4.7 and 11.5 mm. in length, and 30 males, between 5.4 and 12.4 mm. The 2 ovigerous females each measured 11.5 mm.

Color in Life: Carapace and chelipeds varying from rose through pomegranate purple to dark maroon. A pair of elongate longitudinal white spots in middle of carapace, one on each side of mid-line. Underside bluish-white. Eyes greenish-buff. Ambulatories banded with rose and buff, or with pink and white.

Food: The 10 stomachs examined all contained both sand and algae.

Breeding: An ovigerous female carried about 1,050 eggs measuring .32 mm. in diameter.

Remarks: This species has not been reported previously in less than 8 fathoms of water.

Material: Shore of Magdalena Bay: (1 ♂). *Station 136:* D-6 (1 ♂), D-23 (1 ♂), D-30 (3 ♀, 4 ♂). *Station 142:* D-1 (7 ♀, 12 ♂), D-2 (9 ♀, 11 ♂). Cat. Nos. 36,736, 36,899 and 36,900.

Family Grapsidae

Grapsus grapsus (Linnaeus), 1758.

General Range: Pacific coast from Lower California (from San Benito Island) to Chile; Galápagos Islands; western Atlantic from southern Florida and the Bahamas to Pernambuco, Brazil; eastern Atlantic.

Local Distribution: Abundant on the rocks around Cape San Lucas and the shores of Santa Inez Bay. One young male (Cat. No. 36,902) from Santa Inez point, preserved.

Pachygrapsus crassipes Randall, 1840.

General Range: From Oregon to the Gulf of California; Galápagos Islands; Chile; Japan and Korea.

Local Distribution: 2 specimens were taken, a non-ovigerous female, 14.5 mm. in length, from the shore of Magdalena Bay (Cat. No. 36,903), and an ovigerous female, 25 mm. in length, from the shore of Santa Inez Bay (Cat. No. 36,904).

Food: The stomach of the Magdalena Bay specimen contained algae; that from Santa Inez Bay was empty.

Breeding: The latter female carried about 5,000 hatching eggs, measuring .43 mm. in diameter. There were well developed internal eggs in addition.

Planes minutus (Linnaeus), 1758.

General Range: Pelagic in tropical and temperate seas, and occasionally on shore, in weed, on turtles, and logs, and in jellyfishes and sponges.

Local Distribution: An ovigerous female (Cat. No. 36,927), measuring 24.5 mm. in length, was taken in Santa Inez Bay attached to the tail of a green turtle.

Food: Finely digested animal matter. It would be interesting to know if this material represents the excrement of the turtle.

EXPLANATION OF THE PLATES.

PLATE I.

- Fig. 1. *Podochela vestita*, male, length 21.5 mm., dorsal view.
Fig. 2. Same, ventral view.
Fig. 3. *Podochela vestita*, female, length 20 mm., dorsal view.
Fig. 4. Same, ventral view.

PLATE II.

- Fig. 5. *Eucinotops lucasii*, male, length 6.9 mm., dorsal view.
Fig. 6. Same, ventral view.
Fig. 7. *Epialtus minimus*. Series taken at a single locality in Santa Inez Bay (Station 144), showing variation. From left to right, in the top row the first, third, and fourth specimens are males; in the second row the first and third specimens are males; in the third row the third specimen is a male; in the fourth row all specimens are females. (x 1.2).

PLATE III.

- Fig. 8. *Rochinia vesicularis*, male, length ca. 19.5 mm., dorsal view. Tips of rostral horns broken.
Fig. 9. Same, ventral view.
Fig. 10. *Mithrax mexicanus*, male holotype, length 16.2 mm., dorsal view.
Fig. 11. Same, ventral view.
Fig. 12. *Macrocoeloma villosum*, male, length 9.6 mm., dorsal view.

PLATE IV.

- Fig. 13. *Stenocionops beebei*, female holotype, length 56 mm., dorsal view.
Fig. 14. Same, ventral view.
Fig. 15. Same, lateral view.

PLATE V.

- Fig. 16. *Parthenope (Pseudolambrus) excavata*, male, length 15 mm., dorsal view.
Fig. 17. Same, ventral view.
Fig. 18. *Parthenope (Pseudolambrus) triangula*, male, length 8.4 mm., dorsal view.

PLATE VI.

- Fig. 19. *Actaea crockeri*, male holotype, length 5.5 mm., dorsal view.
Fig. 20. *Glyptoxanthus felipensis*, male, length 8.4 mm., dorsal view.
Fig. 21. Same, ventral view.

PLATE VII.

- Fig. 22. *Pilumnus pelagius*, female holotype, length 9 mm., dorsal view.
Fig. 23. Same, ventral view.
Fig. 24. *Chasmocarcinus ferrugineus*, female holotype, length 9.2 mm., dorsal view.

PLATE VIII.

- Fig. 25. *Cymopolia cortezi* sp. nov., male holotype, length 7.9 mm., dorsal view.
Fig. 26. *Cymopolia zacae*, male holotype, length 8.5 mm., dorsal view.